Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1 – 22 (Canceled).

Claim 23 (Currently Amended): A projection exposure apparatus ~~having~~ comprising:

an illumination optical system ~~for~~ which irradiat~~inges~~ a pattern formed on a mask with an exposing energy having a wavelength in an ultraviolet range; and

a projection optical system ~~for~~ which project~~ings~~ an image of the pattern of the mask at a predetermined position on a substrate; characterized by

a first ~~detection means~~ detector, disposed in a vision field of the projection optical system outside an image projection region in which an image of the pattern of the mask is projected, which receives at least a portion of the exposing energy passing through the projection optical system and travelling toward the substrate and output a detection signal in accordance with an intensity of the exposing energy received;

a second ~~detection means~~ detector which detects an intensity of the exposing energy in a predetermined position in a light path extending from a light source disposed in the illumination optical system to the mask and which output a detection signal in accordance with the intensity of the exposing energy detected;

a variation ~~detection means~~ detector which detects a variation in an attenuation factor with respect to the exposing energy, which occurs in a light path of the ~~irradiation means~~ illumination optical system or in a light path of the projection optical system; and

an exposure ~~control means~~ controller which corrects an exposing condition for exposing the substrate so as to provide the substrate with a desired exposure amount, when such a variation in the attenuation factor is detected by the variation ~~detection means~~ detector.

Claim 24 (Currently Amended): The projection exposure apparatus as claimed in claim 23, wherein the first ~~detection means~~ detector further comprises a reflecting member disposed at a top end on the image plane side of the projection optical system and outside the image projection region; and a photoelectric element for photoelectrically detecting a portion of the exposing energy reflected with the reflecting member.

Claim 25 (Original): The projection exposure apparatus as claimed in claim 24, wherein the reflecting member is composed of a full reflection mirror plane so as to block an arrival at the substrate of the exposing energy passed through outside of the image projection region.

Claim 26 (Currently Amended): The projection exposure apparatus as claimed in claim 23, wherein the exposure ~~control means~~ controller is to correct at least one of an intensity of the exposing energy emitting from the light source, an attenuation factor of an attenuator disposed in the ~~irradiation means~~ illumination optical system, and an irradiation time for irradiating the exposing energy to the substrate, in accordance with the variation in the attenuation factor detected.

Claim 27 (Currently Amended): The projection exposure apparatus as claimed in claim 23, wherein the light source comprises an ultraviolet laser light source ~~for~~ which radiat~~inges~~ a light in a wavelength width set so as to avoid an absorption band of oxygen in a wavelength region shorter than 250 nm.

Claim 28 (Currently Amended): The projection exposure apparatus as claimed in claim 23, further comprising: a movable stage mechanism ~~for~~ which mov~~inges~~ in a plane parallel to the image plane of the projection optical system in a state in which the substrate is loaded thereon; and a third ~~detection means~~ detector, disposed in the movable mechanism, for detecting an illuminance of the exposing energy obtained in an image projection region on the image plane side of the projection optical system; wherein the exposure ~~control means~~ controller is to correct the exposing condition on the basis of a result of detection by the variation ~~detection means~~ detector and the third ~~detection means~~ detector.

Claim 29 (Currently Amended): The projection exposure apparatus as claimed in claim 23, wherein the variation ~~detection means~~ detector further comprises an operation processing circuit for sequentially saving data corresponding to a ratio of each detection signal by the first ~~detection means~~ detector to each detection signal by the second ~~detection means~~ detector at every predetermined time and for computing a periodical change rate of the variation in the attenuation factor on the basis of the data saved.

Claim 30 (Currently Amended): The projection exposure apparatus as claimed in claim 23, wherein the variation ~~detection means~~ detector further comprises a fourth ~~detection means~~ detector

disposed in a space between the projection optical system and the substrate so as to enter in an image pattern region in a vision field of the projection optical system or to be evacuated therefrom; and the variation in the attenuation factor is detected by irradiating a transparent portion around a pattern region of the mask with the exposing energy and photoelectrically detecting the light passed through the transparent portion of the mask, when the fourth ~~detection means~~ detector is inserted into the image projection region.

Claim 31 (Currently Amended): The projection exposure apparatus as claimed in claim 30, wherein the exposure ~~control means~~ controller is to calibrate a detection signal corresponding to the variation in the attenuation factor to be detected by the first ~~detection means~~ detector on the basis of a signal detected by the fourth ~~detection means~~ detector.

Claim 32 (Currently Amended): A projection exposure apparatus for scanning an entire image of a pattern of a mask and exposing the entire pattern thereof onto a substrate by scanning the mask and the substrate relative to a vision field of a projection optical system,

the apparatus ~~having~~ comprising:

an irradiation ~~means for~~ system which irradiat~~inges~~ an exposing energy having an ultraviolet wavelength range, a projection optical system ~~for~~ which project~~inges~~ an partial image of the pattern formed on the mask by irradiating a portion of the pattern to be formed on the mask with the exposing energy from the irradiation ~~means~~ system; and

a scanning mechanism ~~for~~ which scan~~nings~~ the mask and the substrate relative to the vision field of the projection optical system; ~~characterized by~~

a restriction ~~means~~ member which restricts an image projection region, in which a partial image of the pattern of the mask is projected, to a ~~polygonal or arc-shaped~~ region extending in a direction intersecting with a relative scanning direction in a vision field of the projection optical system;

a ~~detection means~~ detector, disposed in a region outside the image projection region relating to the relatively scanning direction in the vision field of the projection optical system, which receives at least a portion of the exposing energy passed through the projection optical system and travelling toward the substrate and outputs a detection signal in accordance with the intensity of the energy; and

an exposure ~~control means~~ controller which sets an exposing condition for transcribing the entire image of the pattern thereof on the substrate at a predetermined exposure amount on the basis of the detection signal and for controlling scanning exposure in accordance with the exposing condition.

Claim 33 (Currently Amended): The projection exposure apparatus as claimed in claim 32, wherein the restriction ~~means~~ member is provided with an illumination vision field stop which is disposed in a position substantially conjugated with the mask in a light path of the irradiation ~~means~~ system and which has a linearly slit- shaped or rectangular opening extending in a direction intersecting with a direction of the relative scanning.

Claim 34 (Currently Amended): The projection exposure apparatus as claimed in claim 33, wherein the ~~detection means~~ detector further comprises a reflecting member disposed between the projection optical system and the substrate and a photoelectric element for receiving a portion of the exposing energy reflected by the reflecting member, wherein the reflecting member is disposed in a region within the vision field of the projection optical system and outside the image projection region relating to the relative scanning.

Claim 35 (Currently Amended): The projection exposure apparatus as claimed in claim 34, wherein the exposing energy to be detected by the photoelectric element through the reflecting member passes through a small opening portion formed at a portion of the illumination vision field stop and irradiates through the irradiation ~~means~~ system, the transparent portion around the pattern region of the mask, and the projection optical system.

Claim 36 (Currently Amended): The projection exposure apparatus as claimed in claim 34, wherein the ~~detection means~~ detector is to detect the exposing energy through the reflecting member while the mask is located at an approach run start position for relatively scanning each of plural shot regions when the scanning mechanism scans the mask and the substrate relative to each of the plural shot regions on the substrate.

Claim 37 (Currently Amended): A method for scanning and exposing an entire image of a pattern of a mask to a substrate being exposed, comprising:

~~which is carried out by:~~

irradiating a portion of the pattern of the mask with an exposing energy of an ultraviolet region having a wavelength of 250 nm or less; ~~and~~

scanning the mask and the exposing substrate relative to a vision field of a projection optical system, while projecting a partial image of the pattern thereof onto the substrate through the projection optical system;

~~characterized by the steps of:~~

restricting an image projection region in which the partial image of the pattern thereof is projected to a ~~polygonal or arc-shaped~~ region extending in a direction intersecting with a relative scanning direction in the vision field of the projection optical system upon scanning exposure;

detecting an intensity of at least a portion of the exposing energy passing through a region outside the image projection region relating to the relative scanning direction in the vision field of the projection optical system, at the time of starting the scanning exposure; and

setting an exposing condition for transcribing the entire image of the pattern thereof on the substrate at a predetermined exposure amount on the basis of the intensity of the exposing energy detected, before starting the scanning and exposing.

Claim 38 (Original): The exposure method as claimed in claim 37, wherein a result of detection of the exposing energy passing through the region outside the image projection region relating to the relative scanning in the vision field of the projection optical system is calibrated on

the basis of an illuminance of the exposing energy measured in advance in the image projection region, when the exposing condition is set.

Claim 39 (Original): The exposure method as claimed in claim 37, wherein, when the exposing energy which passes through the region outside the image projection region relating to the relative scanning direction in the vision field of the projection optical system is detected, the intensity of the exposing energy is detected individually in each of the plural positions outside the image projection region, and an irregularity of an attenuation factor in a light path through which the exposing energy passed is measured on the basis of the result of detection.

Claim 40 (Original): The exposure method as claimed in claim 37, wherein the exposing energy comprises pulse light from a narrow-banded ArF excimer laser light source so as to avoid an absorption band of oxygen.

Claim 41 (Original): The exposure method as claimed in claim 40, wherein, when the exposing energy which passes through the region outside the image projection region relating to the relatively scanning direction in the vision field of the projection optical system is detected, a peripheral transparent portion around the pattern region on the mask is located in the vision field on the object side of the projection optical system and outside the image projection region, and the exposing energy is detected through the peripheral transparent portion of the mask.

Claim 42 (Currently Amended): A manufacturing method for forming a circuit device on a substrate, comprising:

~~which is carried out by~~ a lithographic process for projecting and exposing a circuit pattern formed on a mask to be irradiated with an exposing energy of an ultraviolet region having a wavelength of 250 nm or less to each of plural positions on a substrate through a projection optical system; ~~characterized by the steps of:~~

detecting a variation in an intensity of the exposing energy resulting from a variation in an attenuation factor of the projection optical system by detecting at least a portion of the exposing energy passed through an outer region of an image projection region in a vision field of the projection optical system and travelling toward the substrate side at a position close to an image plane of the projection optical system, the image projection region being a region in which an image of the circuit pattern of the mask is formed; and

setting an exposing condition for transcribing the circuit pattern onto the substrate at a predetermined exposure amount on the basis of the variation in the intensity of the exposing energy detected;

wherein a deterioration in precision for controlling the exposure amount due to the variation in the attenuation factor of the projection optical system is reduced, and the variation in the attenuation factor occurs when the image of the circuit pattern is projected and exposed sequentially onto the substrate.

Claim 43 (Original): The manufacturing method for forming the circuit device as claimed in claim 42, wherein a first detector is disposed at a top end portion on the image side of the

projection optical system in order to detect a variation in the intensity of the exposing energy resulting from the variation in the attenuation factor of the projection optical system.

Claim 44 (Original): The manufacturing method for forming the circuit device as claimed in claim 43, wherein a second detector for detecting the intensity of at least a portion of the exposing energy passing through the image projection region is disposed on a movable stage for holding the substrate thereon and for transferring the substrate in a two- dimensional way; and a result of detection by the first detector is calibrated on the basis of a result of detection by the second detector.

Claims 45 – 59 (Canceled).